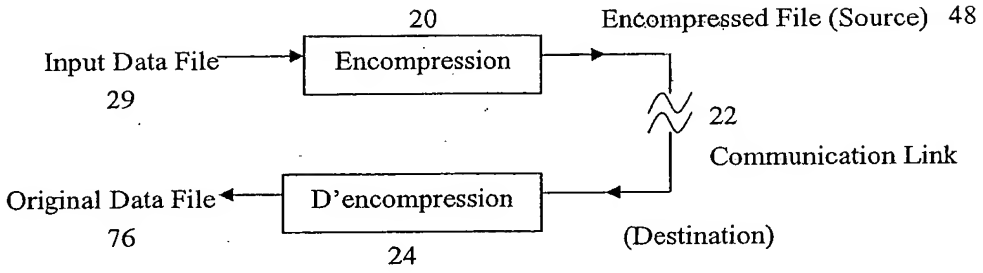
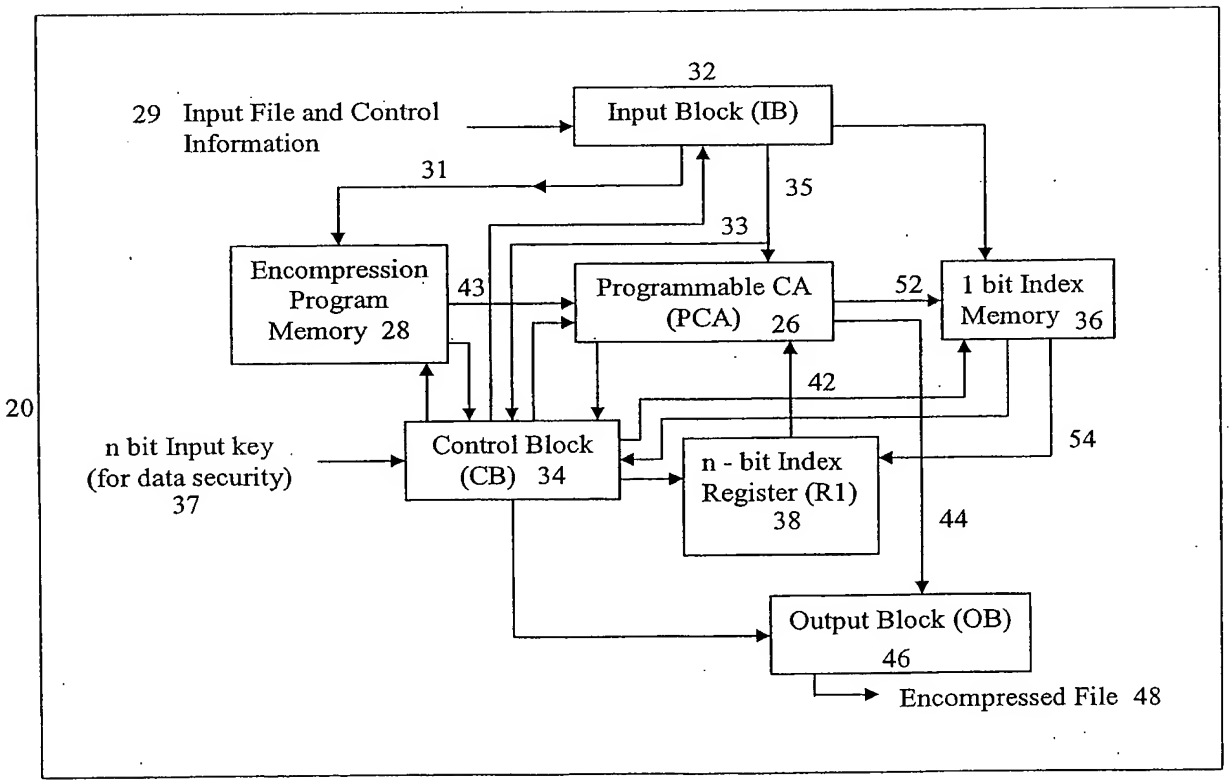
Replacement Sheet

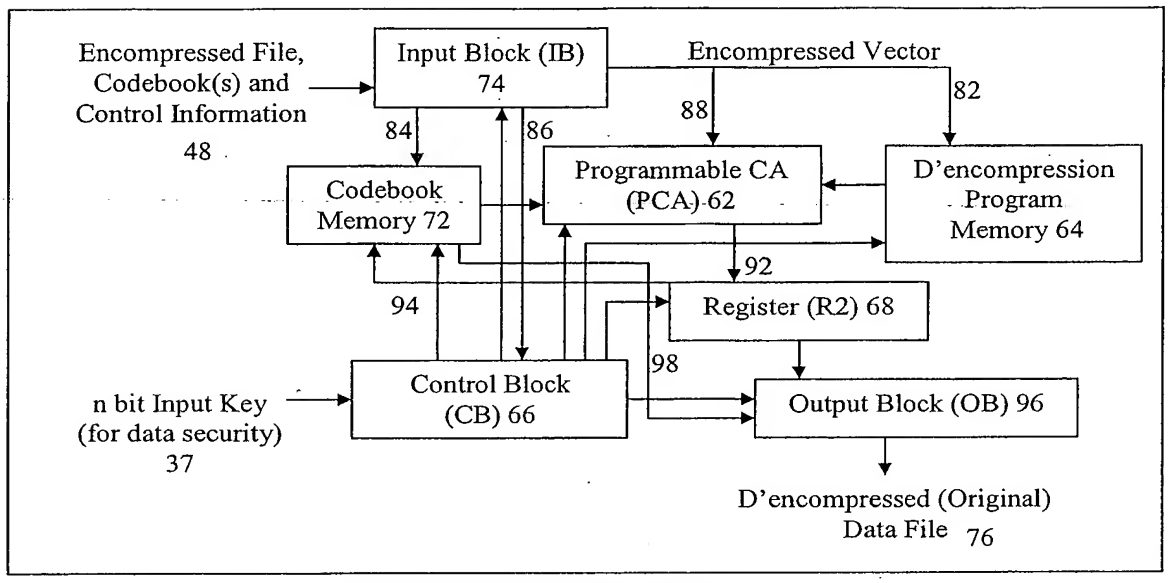


(a) Encompression and D'encompression of Digital Data File



(b) The Encompression module

Replacement Sheet



(c) The D'encompression module

Fig 1. The basic architecture and Encompression / D'encompression module

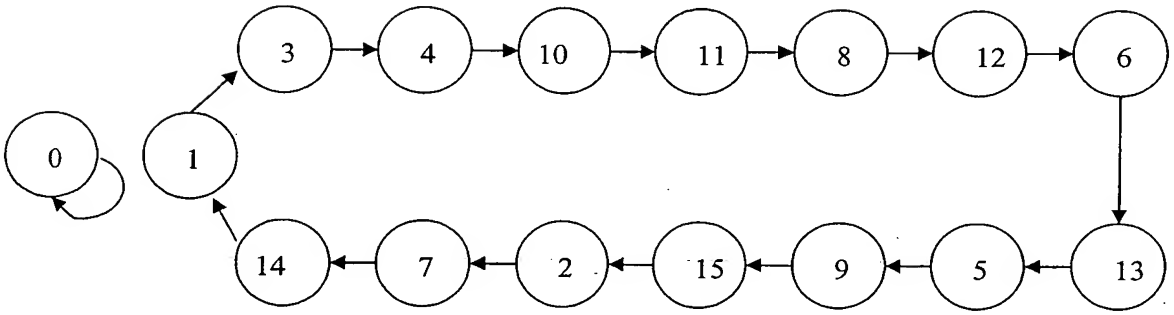


Fig. 2. State transition diagram of a maximum length group CA

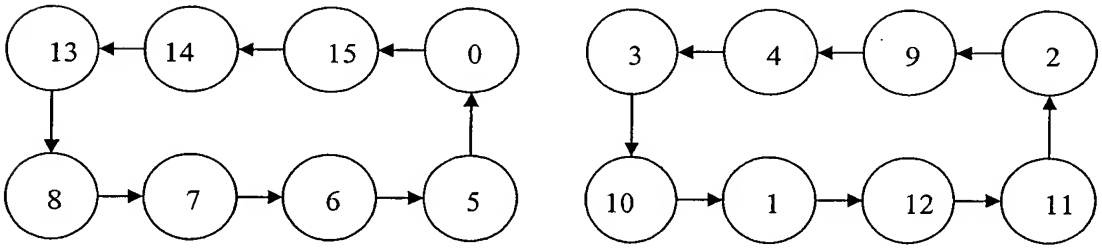
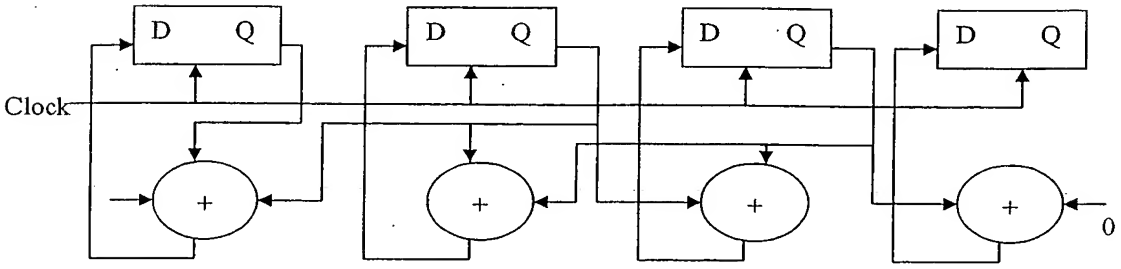
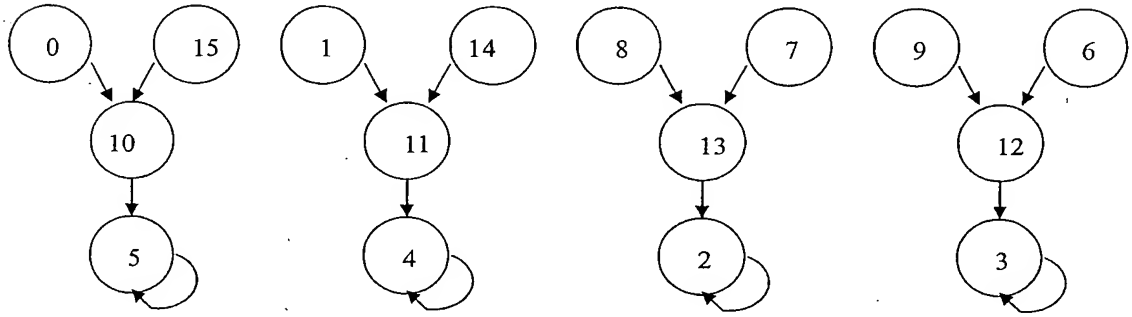


Fig. 3. State transition diagram of a non-maximum length group CA



(a) Structure



Zero - tree

$$T = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix} \quad F = \begin{bmatrix} 1 \\ 0 \\ 1 \\ 0 \end{bmatrix}$$

n = 4
Non reachable states = 0, 15, 1, 14, 8, 7, 9, 6
Attractors = 2, 3, 4, 5

(b) T matrix, F-Vector and State – Transition Diagram

Fig. 4. Structure and Behaviour of a Four – Cell non – group CA
(also referred to as Multiple Attractor CA (MACA))

Replacement Sheet

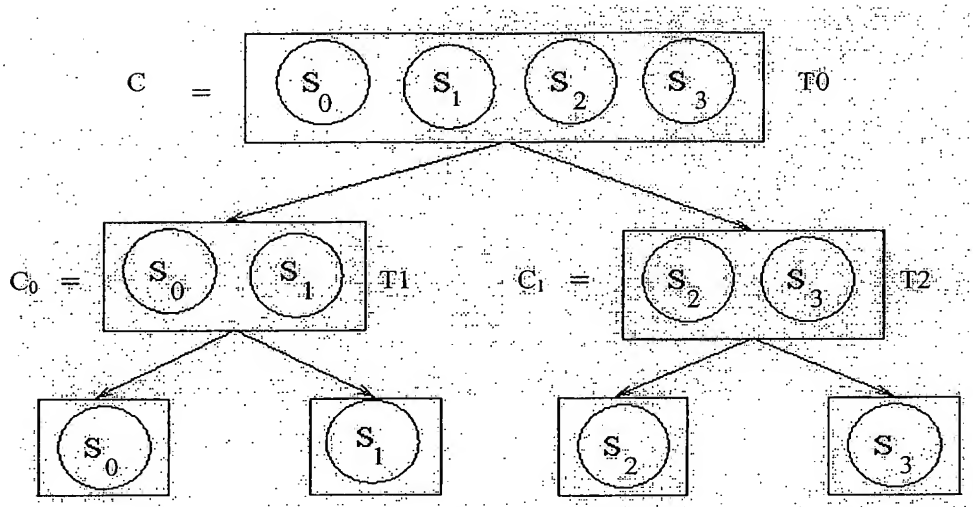


Fig. 5. The logical Structure of multi-class Classifier designed with multi-stage two-class classifiers

Note:
(i) Each classifier is a MACA having the states of one subset of attractor basins belonging to one class while that of the other subset covers the elements of the second class.
(ii) The PEF (Pseudo Exhaustive Field) field of attractor is used as the address to access 1 bit Index Memory (36 in Fig 1 (b)) that stores 1 bit (0 or 1) class information of two-class classification.

Replacement Sheet

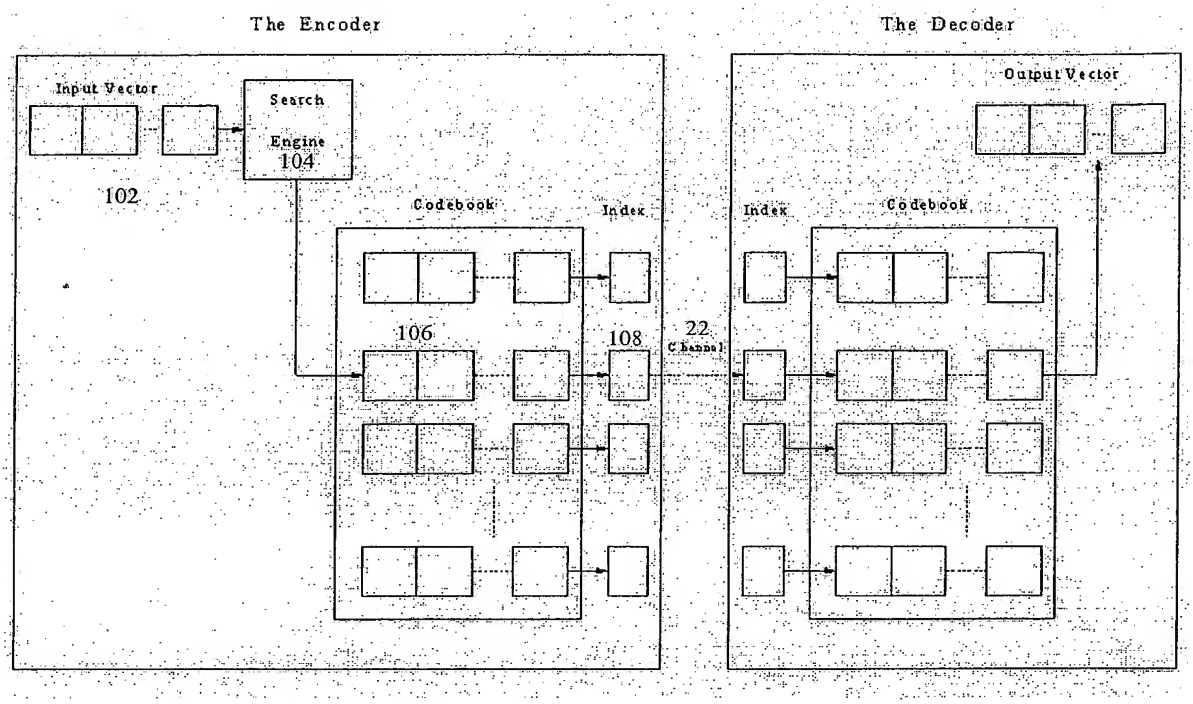


Fig. 6. Encoder and Decoder

Replacement Sheet

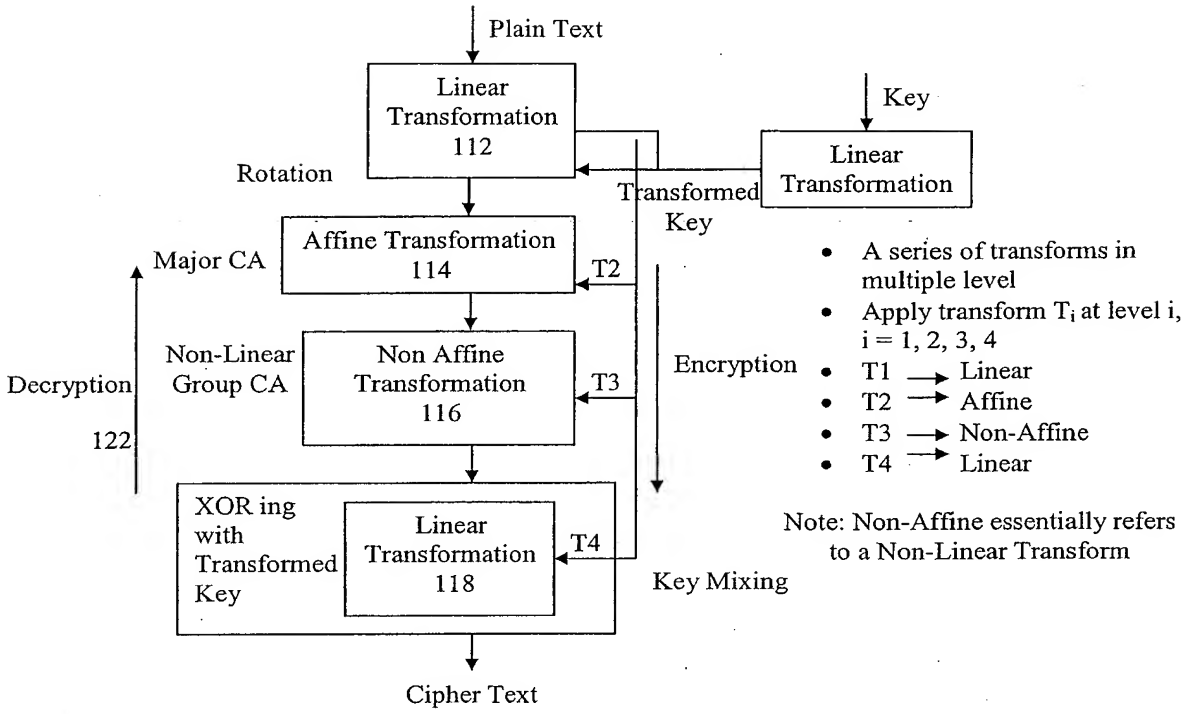


Fig. 7. Block Diagram of Encryption Scheme integrated in the Encompression Algorithm